IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended)   A unit ~~(100, 101, 200, 201, 301)~~ comprising:

n (n≥1) integrators ($I_{1...n}$) in series, a first of the n integrators ($I_{1...n}$) receiving an input signal;

~~at least one~~ a first device ~~(Q)~~ which acts as a quantizer when an absolute value of a signal input ~~thereto~~ to the first device is smaller than a predetermined value, and acts as a gain element when the absolute value ~~of the signal input thereto~~ is larger than the predetermined value; and

a second device ~~(12)~~ for quantizing an output of the unit ~~(100, 101, 200, 201, 301)~~.

2. (Currently Amended)   The unit ~~(100, 101 200, 201, 301)~~ of

claim 1, wherein the ~~at least one~~ first device acts as a gain

device, with or without an offset.

3.(Currently Amended) The unit ~~(100)~~ of claim 2, wherein the

signal input to the ~~at least one~~ first device ~~(Q_1)~~ is an output of

a first integrator of the integrators ~~(I_n)~~ and ~~the~~ an output of the

~~at least one~~ first device ~~(Q_1)~~ is input to the second device ~~12~~ and

as weighted feedback paths to the n integrators ($I_{1..n}$).

4.(Currently Amended) The unit ~~(100)~~ of claim 2, wherein the

signal input to the ~~at least one~~ first device ~~(Q_1)~~ is an output of

a first integrator of the integrators ~~(I_n)~~ and the output of the

first integrator (I_n) is input to the second device ~~(12)~~, and ~~the~~

an output of the ~~at least one~~ first device ~~(Q_1)~~ is input to ~~the~~

weighted feedback paths to the n integrators ($I_{1..n}$).

5.(Currently Amended) The unit ~~(101)~~ of claim 2, wherein ~~the~~

signals output from the n integrators $I_{1..n}$ are weighted and summed

and the summed output is input to the ~~at least one~~ first device

~~(Q_1)~~, and wherein an output of the first ~~at least one~~ device ~~(Q_1)~~

is input to the second device (12) and to an integrator (I$_1$) of the
n integrators.

6.(Currently Amended) The unit (101) of claim 2, wherein the
signals output from the n integrators (I$_{1...n}$) are weighted and summed
and the summed output is input to the at least one first device (Q$_1$
) and the second device (12), and an output of the at least one
first device (Q$_1$) is input to the an integrator (I$_1$) of the n
integrators.

7.(Currently Amended) The unit (200) of claim 2, wherein the
signal input to the at least one first device (Q$_{1...m}$) where m≤n, is
an output of the an integrator (I$_n$) of the n integrators, the
outputs and wherein an output of the at least one first device
(Q$_{1...m}$) is input as weighted feedback paths to one or more of the n
integrators (I$_{1...n}$) and an the output of the integrator (I$_n$) is input
to the second device (12).

8.(Currently Amended) The unit (200) of claim 2, wherein the
signal input to the at least one first device (Q$_{1...n}$), is an output

of ~~the~~ an integrator ~~(I_n)~~ of the n integrators, ~~the outputs~~ and wherein an output of the ~~at least one~~ first device ~~(Q_{1...m})~~ is input as weighted feedback paths to one or more of the n integrators ~~(I_{1...n})~~, and wherein the output of ~~any of~~ the ~~at least one devices~~ ~~(Q_{1...m})~~ the first device is input to second device ~~(12)~~.

9. (Currently Amended) The unit ~~(201)~~ of claim 2, wherein ~~the~~ signals output from the n integrators ($I_{1...n}$) are weighted and summed, the summed output is input to the ~~at least one~~ first device ~~(Q_{1...m}) outputs~~ and wherein an output of the ~~at least one~~ first device ~~(Q_{1...m})~~ is input to one or more of the n integrators ($I_{1...n}$), and ~~an~~ the output of ~~one of the at least one~~ the first device ~~(Q_{1...m})~~ is input to the second device ~~(12)~~.

10. (Currently Amended) The unit ~~(201)~~ of claim 2, wherein ~~the~~ signals output from the n integrators ($I_{1...n}$) are weighted and summed by a summer, the summed output is input to the ~~at least one~~ first device, and wherein an output ~~(Q_{1...m}), outputs~~ of the ~~at least one~~ first device ~~(Q_{1...m}) are~~ is input to one or more of the n integrators ($I_{1...n}$), and an output of the summer ~~(13) output~~ is input to the

second device ~~(12)~~.

11. (Currently Amended) The unit ~~(301)~~ of claim 2, wherein ~~the~~

signals output from the n integrators ($I_{1...n}$) are weighted and

summed, the summed output is input to the ~~at least one~~ first device

~~($Q_{1...m}$)~~ and the second device ~~(12)~~, and ~~outputs~~ wherein an output of

the ~~at least one~~ first device ~~($Q_{1...m}$)~~ is input to one or more of the

n integrators ~~($I_{1...n}$)~~.

12. (Currently Amended) The unit ~~(301)~~ of claim 2, wherein ~~the~~

signals output from the n integrators ($I_{1...n}$) are weighted and

summed, the summed output is input to the ~~at least one~~ first device

~~($Q_{1...m}$)~~, and ~~outputs~~ wherein an output of the ~~at least one~~ first

device ~~($Q_{1...m}$)~~ ~~are~~ is input to one or more of the n integrators ($I_{1...n}$)

and ~~an~~ the output of ~~one of the at least one~~ the first device ~~($Q_{1...m}$)~~

is input to second device ~~(12)~~.

13. (Currently Amended) An analog to digital converter

including the unit ~~(100, 101, 200, 201, 301)~~ of claim 1.

14. (Currently Amended)   A digital to digital converter including the unit (100, 101, 200, 201, 301) of claim 1.

15. (Currently Amended)   The unit (100, 101, 200, 201, 301) of claim 1, wherein each of the m devices (Q₁...ₘ) has further comprising a plurality of the first device each having different parameters set to improve stability, improve SNR, and/or reduce introduction of artifacts.

16. (Currently Amended)   A method, comprising method comprising the acts of:

inputting a signal to n (n≥1) integrators ($I_{1...n}$) in series to output an integrated signal; and

forming an output signal by quantizing the integrated signal when an absolute value of a the integrated signal input thereto is smaller than a predetermined value, and amplifying, with or without offset, when the absolute value of the signal input thereto is larger than the predetermined value; and

quantizing an output the output signal.

17. (New)   A unit comprising:

means for integrating a signal to form an integrated signal;

means for forming an output signal by quantizing the

integrated signal when an absolute value of the integrated signal

is smaller than a predetermined value, and amplifying the

integrated signal when the absolute is larger than the

predetermined value; and

means for quantizing the output signal.

18. (New)   The unit of claim 17, further comprising weighting

means located between the means for integrating and the means for

forming.

19. (New)   The unit of claim 17, wherein the means for

integrating includes a plurality of integrators, and the unit

further comprises summing means for summing outputs of the

plurality of integrators to provide an input to the means for

forming.

20. (New)   The unit of claim 17, wherein the means for forming

include a plurality of devices having parameters chosen to reduce

an effective order of the unit when the signal has a first

amplitude and to increase the effective order when the signal has a

second amplitude.